

SHORT COMMUNICATIONS

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UNUSUAL LEG INJURY IN A NESTLING BALD EAGLE

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In this paper we report a tarsometatarsal joint dislocation, possible cause of the injury, and subsequent effects on a nestling Bald Eagle (*Haliaeetus leucocephalus*). Joint dislocations in raptors are uncommon, most occurring in the pelvis in tethered, captive birds (P. Redig, Raptor Research and Rehabilitation Program (RRRP), University of Minnesota, pers. comm.). The RRRP has treated only 2 tarsometatarsal joint dislocations within the past 15 yr, and at the National Wildlife Health Laboratory (Madison, Wisconsin) such an injury is rare (N. Thomas, pers. comm.).

Our observations during a prenesting through post-fledging period, 16 March-4 September 1985, totaled 1038 hrs (approximately 50% of daylight hrs) at a nest near Lake McDonald in Glacier National Park, northwestern Montana. Observations were made with a spotting scope 2-3 km from the nest, a distance which did not appear to interfere with adult nesting and foraging activity.

Incubation commenced on 11 April. Thirty-five d later changes in adult behavior indicated that at least 1 egg had hatched. We were unaware that the eaglet was crippled until we banded the 8-wk-old nestling on 10 July and noticed that the bird's right leg was deformed. The tarsometatarsus and toes were rotated 90° with the hallux pointing inward. The tarsometatarsal joint was noticeably swollen. Although the young bird could move the crippled leg toward its breast, a normal standing position was not possible. We observed that the toes and talons were useless for perching or grasping prey (Fig. 1).

Tarsometatarsal joint dislocation probably occurred within 14 d after hatching, when distorting forces would most likely cause a separation at the distal cartilaginous growth plate (P. Redig, pers. comm.). Such forces could have resulted from a number of events. No evidence (such as scarring of skin tissue) of an encounter with a predator was observed. The nestling could have caught its leg between nest sticks, but this is unlikely because very young chicks do not venture far from the nest cup. However, we recorded 1 disturbance during the first 14 d after hatching which may have caused an adult to step on the chick. During this period the nest was observed for 55% of the daylight hours. On 24 May, when the chick was 8 d old, a loud sonic boom originated from a military jet approximately 10 km from the nest at 1053 H. The noise caused the brooding adult to vault to a standing position and look toward the disturbance source. We could not see the nest-

ling, but the unusual brooding and feeding activity subsequent to the noise indicated that the adults were greatly disturbed. We also have observed flushes of migrant Bald Eagles as a result of sonic booms during autumn Bald Eagle concentrations at Lower McDonald Creek in Glacier National Park.

Prior to 24 May, continuous brooding was observed, and feedings averaged 0.4 bouts/hr. Immediately after the sonic boom, the attending adult moved to the nest edge for 20 min but returned to feed the nestling 3 times in the next 45 min, which was the most frequent feeding observed. A third feeding bout lasted 18 min, the longest bout recorded during the first 26 d of the nestling period. Just prior to the third feeding bout, the adult left the nest for 1 min (the first observation of the chick being unattended for even a brief period). The adult did not return to a brooding posture during the entire 3.5 hr observation interval following the disturbance, the longest non-brooding period until 31 May. Later, between 1800 and 2107 H, the adults exchanged brooding 3 times. We did not record any other brooding substitutions that were made as frequently. Brooding time during this period ranged from 1-23 min; no other broodings as brief were recorded. Frequent feedings and brooding exchanges and the adults' agitated behavior following disturbance were dissimilar to observations made prior to the sonic boom. We observed similar agitated behavior the following year, on 14 April 1986, after a Common Raven (*Corvus corax*) consumed at least 1 eagle egg at the same nest.

Considering the unusual behavior of the Lake McDonald adults immediately following the sonic boom, we believe that the event probably resulted in the eaglet's injury. We recognize that evidence linking this eaglet's injury to a sonic boom is circumstantial. However, T. Grubb (U.S. Forest Serv., Tempe, Arizona, pers. comm.) found that nesting Bald Eagles in Arizona reacted to sonic booms (N = 77) 58% of the time by becoming alert or by flying. Ellis (Responses of raptorial birds to low level military jets and sonic booms. Inst. Raptor Stud., Oracle, Arizona. 59 pp., 1981) determined that sonic booms were disruptive to nesting Peregrine Falcons (*Falco peregrinus*) in Arizona and caused some adults to flee their nests. He also stated that eggs or tiny young might be dislodged from a nest by a fleeing adult.

The injured leg was an obvious handicap to the eaglet during the late nestling period when the bird could be



Figure 1. Nestling Bald Eagle (8 wks) showing rotated right tarsometatarsus (arrow points to rotated hallux).



Figure 2. Fledgling Bald Eagle (16 wks) showing rotated right tarsometatarsus and elevated position of leg (arrow points to rotated hallux).

seen hobbling across the nest. The eaglet often balanced on the normal leg with the crippled leg held close to the abdomen (Fig. 2). The only movement observed in the injured leg was a flexion of toes, and the eaglet had difficulty feeding. The eaglet first attempted to feed itself at 6 wk post-hatching; the adults continued to feed the eaglet intermittently until 13 wk post-hatching (2 wk prior to fledging). Cain (Nesting activity time budgets of Bald Eagles in Southeast Alaska. M.S. Thesis. Univ. of Montana, Missoula. 47 pp., 1985) reported that nesting Bald Eagles in Alaska fed young until fledging.

Exercise bouts (wing-flapping and bounding) increased in frequency during July and August, with the highest number of bouts (26) occurring on the day of fledging, 29 August. At 1712 H the eaglet fell from the nest during a flapping bout, clung to the edge of the nest with its normal leg, and finally flapped back into the nest several seconds later. Wing-flapping continued every 15–20 min for the next hr. At 1945 H the eaglet hopped to the edge of the nest, extended its wings and flew for 10–15 s before dropping out of view into the surrounding old-growth forest canopy. Normal fledging of Bald Eagles occurs at 10–12 wk (Brown, L. H., and D. Amadon. *Eagles, hawks and falcons of the world*. Vol. 1. McGraw-Hill Book Co., New

York, NY. 414 pp. 1968). The crippled eaglet fledged from the Lake McDonald nest 15 wk (105 d) after hatching.

The adults were not seen in the McDonald Valley for 2 d prior to the fledging date, and the eaglet had not fed for 35 hr before leaving the nest. At 0715 H on 30 August we found the bird on the ground, about 200 m east of the nest tree. The adults returned to the nest area at 1412 H and flew into the forest near the fledgling, left the area 1 hr 43 min later and were not observed on the territory again until 12 October.

By 1430 H on 1 September the fledgling arrived at the Lake McDonald shoreline 400 m downslope from the nest tree. The eaglet made a 30 m flight and hobbled to the lakeshore through thick undergrowth after crossing a nearby road. The bird appeared to be exhausted as it flew to a tree along the shore and tried to perch. By 1330 H on 2 September the eaglet moved 400 m downshore near several private homes. The bird could fly up to 100 m but could not perch in a tree; instead, the eaglet hung from branches by its wings, eventually tumbling to lower branches or to the ground.

On 3 September we captured the juvenile and relocated it to near one of the adults' frequently-used perches, 1 km

south of private homes, with hopes that the adults would return and care for the young bird. When the adults did not return we recaptured the eaglet at 1400 H on 4 September for medical examination.

P. Redig determined that the injury could not be corrected and the fledgling was euthanized. Necropsy revealed that the eaglet had a severe luxation of the right tarso-metatarsal joint and was emaciated.

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PREDATION OF BALD EAGLES (*Haliaeetus leucocephalus*) ON AMERICAN COOTS (*Fulica americana*)

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Observations of Bald Eagle (*Haliaeetus leucocephalus*) predation on the American Coot (*Fulica americana*) were made along the east shore of Flathead Lake, 16-22 km northeast of Polson, Lake County, Montana, between 13-22 January 1978. During this time a group of 50-1000 coots fed in Gravel Bay. The coots were in a close aggregation (Fig. 1A) with individuals separated by about 1-2 m. Occasionally coots fed by diving 3-6 m deep into this glacial, oligotrophic lake for filamentous algae attached to submerged rocks.

At night, the coots formed a tight aggregation with individual coots in contact with each other forming a raft (or a Pod 1 group, *vide* Breder 1959) (Fig. 1B). I observed these rafts near dark, 1630 H, 15 January and at 0945 H, 21 January.

On 15 January between 1430-1500 H, I observed a large feeding aggregation of about 400 coots in Gravel Bay. A Bald Eagle flew over the bay and then soared 10-

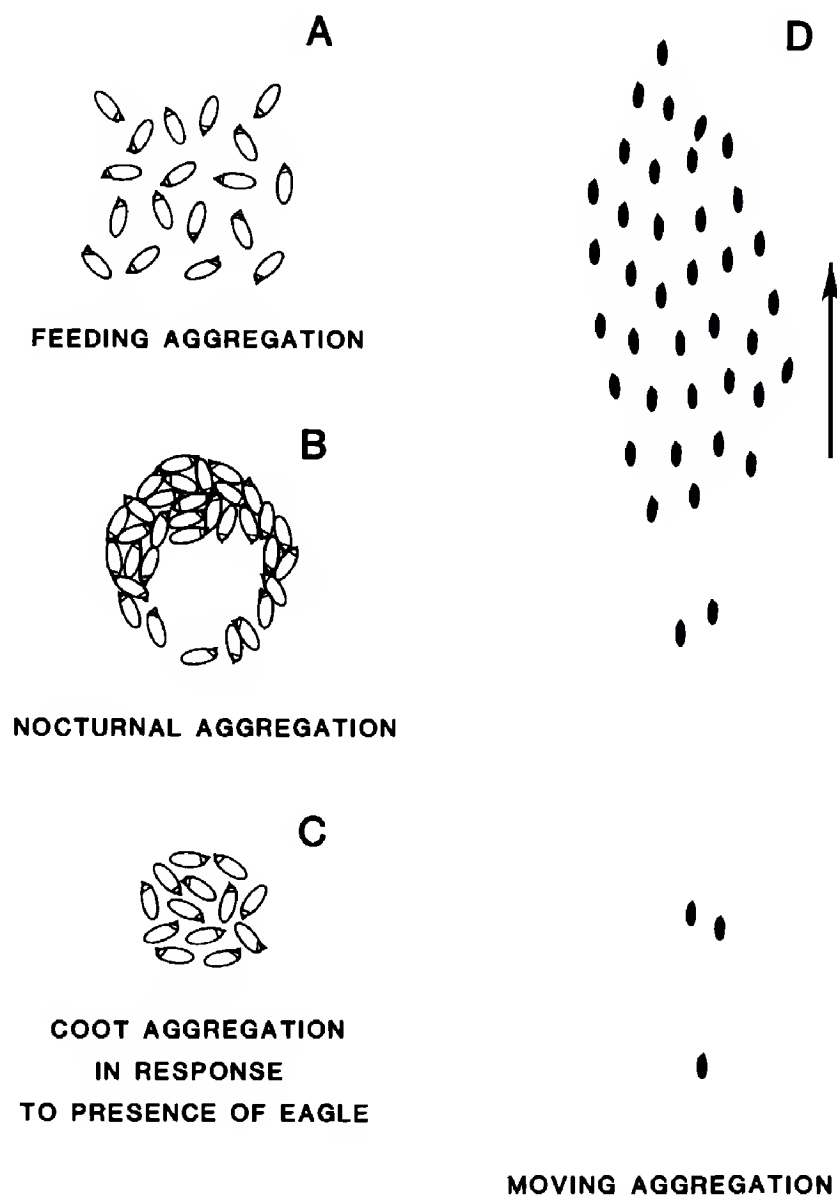


Figure 1. Behavior patterns of American Coots. (A) feeding aggregation; coots 1-2 m apart; (B) nocturnal aggregation; most coots in contact with one or more coots; (C) anti-predator aggregation in response to the presence of a Bald Eagle; coots about 10-20 cm apart; (D) moving aggregation: coots about 1 m apart; stragglers are at greater distance from main group; the eagle attack described in the text was on the last solitary coot.